



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In the application of:

Kimikazu NAGASE et al.

Serial No.: 09/825,931

Filing Date: April 5, 2001

For: DIRECTLY IMAGEABLE
PLANOGRAPHIC PRINTING PLATE
AND PRODUCTION METHOD
THEREOF

Examiner: Amanda C Walke

Group Art Unit: 1752

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Assistant Commissioner for Patents
Washington, DC 20231

Sir:

DECLARATION UNDER 37 CFR 1.132

I, Kimikazu NAGASE, a citizen of Japan residing in Shiga-ken, hereby declares under penalty of perjury as follows:

1. I am a named inventor in the above-identified patent application.
2. I have read and am familiar with the Official Action of March 10, 2003, and have also read EP 897795 to Ichikawa et al. The purpose of this Declaration is to show that closest prior art samples of Ichikawa, namely samples of Examples 7 and 24, do not possess the properties recited in the independent pending claims, namely, the limitations:

an ultraviolet absorption spectrum of said directly imageable planographic printing plate precursor, observed by the transmission method, has the following features:

- (1) the main peak in the ultraviolet absorption spectrum exists between 700 nm and 1,200 nm, and

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(2) the ratio A/B of the absorbance at 830 nm (A) to the absorbance at 650 nm (B) is not less than 3.0.

3. I received a Master's degree in Chemistry, with specialization in surface reaction mechanisms, from Tokyo University in 1978.

4. I entered employment with Toray Industries, Inc., the assignee of this application, in 1978 and have been engaged since then mainly in research on graphic art materials at the Pioneering Research & Development Laboratories (1979-1987) and Electronic & Imaging Materials Research Laboratories (1987-2002) of Toray Industries, Inc. (Toray). I am now an assistant general manager at the Research and Development Planning Department at Toray.

5. I and/or those under my direct supervision and control reproduced Examples 7 and 24 of Ichikawa. I concluded that Example 7 is the closest to Examples of the present application for the following reasons. In Example 7 "KAYASORB" IR-820(B) is used as a light-to-heat converting material in the heat sensitive layer, and polyurethane is also used as a component in the heat sensitive layer. In addition, the transparent heat insulating layer which contains no titanium oxide is provided between the aluminum substrate and the heat sensitive layer. Moreover, having regard to the hydrazine compound (F), which is used in the most Examples of Ichikawa, Example 7 is suitable as the closest representative example. I also selected Example 24 as another close representative example in order to clarify the influence of the variation of the hydrazine compound.

6. The printing plate precursors of Examples 7 and 24 were prepared according to the disclosure of Ichikawa. The compound (F) was synthesized as follows.

Synthesis of the compound (F)

Copolymer of acrylic acid and allyl acrylate (molar ratio=35:75) was prepared by radical polymerization with 2,2'-azobisisobutyronitrile (AIBN) as an initiator in 1,4-dioxane and precipitated by pouring the polymerization solution into n-hexane. The precipitate was filtered and dried in the vacuum oven. The copolymer was dissolved in N,N-dimethylformamide and reacted with hydrazine monohydrate in amounts equimolar with acrylic acid unit. Moreover, adding glycidyl methacrylate in amounts equimolar with acrylic acid unit, the solution of compound (F) was obtained. The solid component concentration of the solution was 15 wt%.

7. Laser irradiation in the imaging step was performed in the condition described in Example of the present application because the apparatus disclosed in Ichikawa was not available now.

Example 7

A heat insulating layer of film thickness 4g/m^2 was provided by coating a primer liquid of the following composition onto a degreased aluminum sheet of thickness 0.15mm using a bar coater and drying for 2 minutes at 180 degrees centigrade.

Heat Insulating Layer Composition (solid component concentration 13 wt%)

- (a) polyurethane resin ("Sanprene" LQ-T1331, produced by Sanyo Chemical Industries Ltd.) 90 parts by weight
- (b) blocked isocyanate ("Takenate" B830, produced by Takeda Chemical Industries Ltd.) 35 parts by weight
- (c) epoxy-phenol-urea resin (SJ9372, produced by the Kansai Paint Co., Ltd.) 8 parts by weight
- <Solvent Component>
- (d) N,N-dimethylformamide

Next, on this there was provided a heat sensitive layer of film thickness 1g/m^2 by applying the following heat sensitive layer composition using a bar coater and drying for 3 minutes at 90 degrees centigrade.

Heat Sensitive Layer Composition (solids component concentration 10 wt%)

- (a) infrared absorbing colouring matter ("Kayasorb" IR-820(B), produced by Nippon Kayaku Co., Ltd.) 10 parts by weight
- (b) Compound F with N-N bonds in side chains 35 parts by weight
- (c) polyglycerol polyglycidyl ether ("Denacol" EX512, produced by Nagase Chemical Ltd.) 5 parts by weight

(d) polyurethane resin composition ("Sanprene" IB-465, solids component 30 wt%, produced by Sanyo Chemical Industries Ltd.) 170 parts by weight (having a dimethylformamide component of 119 parts by weight

<Solvent Component>

(d) tetrahydrofuran 22 parts by weight

(e) dimethylformamide 56 parts by weight

(f) methyl isobutyl ketone 22 parts by weight

Next, on this was provided a silicone rubber layer of film thickness 2 g/m² by applying an addition-type silicone rubber layer composition with the following composition using a bar coater and hardening for 2 minutes at 125 degrees centigrade.

Silicone Rubber Composition (solids component concentration 11 wt%)

(a) polysiloxane containing vinyl groups 90 parts by weight

(b) hydrogen polysiloxane 8 parts by weight

(c) polymerization inhibitor 2 parts by weight

(d) catalyst 5 parts by weight

<Solvent Component>

(e) "Isopar-E" (produced by Exxon Chemical Japan Ltd.)

Using a calender roller, "Torayfan" polypropylene film (produced by Toray Industries, Inc.) of thickness 8 micrometers was laminated to the laminate obtained as described above, to obtain a directly imageable waterless lithographic printing plate precursor.

[Plate Processing]

Subsequently, the "Torayfan" was peeled off from this printing plate precursor. The printing plate precursor was fitted to a plate-making machine (FX400-AP, Toray Engineering Co., Ltd.), and irradiated with semiconductor laser beam (wavelength 830nm, beam diameter 20 μm) under the conditions of exposure time of 10 μs and irradiation energy of 125 mJ/cm².

[Plate Development]

Next, the aforesaid irradiated plate was developed using a TWL-1160 (a waterless planographic printing plate developing machine, produced by Toray Industries, Inc.) at a rate of 80 cm/min. Here, as a pre-treatment liquid, there was employed a liquid with the following composition at a liquid temperature of 40 degrees centigrade.

- (a) polypropylene glycol (molecular weight 200) 95 parts by weight
- (b) water 5 parts by weight

Furthermore, water was used as the developing liquid and liquid temperature was 25 degrees centigrade. As a dye liquid, there was employed a liquid with following composition and the liquid temperature was 25 degrees centigrade.

- (a) C. I. Basic Blue 1 dyestuff 0.2 parts by weight
- (b) butyl carbitol 5 parts by weight
- (c) sodium 2- ethylhexylsulphate 0.3 parts by weight
- (d) silicone antifoaming agent 0.0005 parts by weight
- (e) water 95 parts by weight

Example 24

Preparation of the plate material was all carried out in the same way as in Example 7 except that the heat sensitive layer composition was changed to the following.

Heat Sensitive Layer Composition (solids component concentration 11 wt%)

- (a) infrared absorbing colouring matter ("Kayasorb" IR-820(B), produced by Nippon Kayaku Co., Ltd.) 10 parts by weight
- (b) polymethacrylic acid hydrazide synthesized in Synthesis Example 3 60 parts by weight
- (c) polyglycerol polyglycidyl ether ("Denacol" EX512, produced by Nagase Chemical Ltd.) 10 parts by weight
- (d) polyurethane resin ("Sanprene" LQ-T1331, 20 wt % solids component, produced by Sanyo Chemical Industries Ltd.) 100 parts by weight (having a dimethylformamid component of 80 parts by weight)

<Solvent Component>

- (h) tetrahydrofuran 30 parts by weight
- (e) dimethylformamide 50 parts by weight

(f) methyl isobutyl ketone 20 parts by weight

8. The reflected absorptions of the printing plates obtained above were measured by the procedure disclosed in Example of the present application and are summarized in Table 1.

Table 1

	Reflected Absorption of Printing Plate		
	Non-printing area	Printing area	Difference
Example 7	1.09	1.57	0.48
Example 24	1.13	1.29	0.16

According to Example 7, the difference between the reflected absorption of the non-printing area and the reflected absorption of the printing area, observed after dyeing of the printing plate at the absorption maximum wavelength of the dye in the dyeing solution was 0.48, which falls within the claimed range (0.3 ~ 2.0) of the present invention. According to Example 24, the reflected absorption difference between the non-printing area and the printing area was 0.16, which is outside the claimed range of the present invention.

9. Next, the printing plate precursors with the transparent substrates were produced in the same procedure as Example 7 and 24 except that a 50 micrometers thick poly(ethyleneterephthalate) film ("Lumirror" T150, produced by Toray Industries, Inc.) was used as a substrate in the place of an aluminum sheet. The drying condition of the heat insulating layers was changed from 2 minutes, 180 degrees centigrade to 5 minutes, 120 degrees centigrade.

10. By transmission method, the ratios A/B of the absorbance at 830 nm (A) to the absorbance at 650 nm (B) were measured. These results are summarized in Table 2.

Table 2

	Absorbance of the printing plate precursor			
	830 nm (A)	650 nm (B)	A/B	λ max(400~700)
Example 7	1.1262	0.6626	1.70	0.67
Example 24	1.6121	0.9152	1.76	0.92

The ratios A/B of *both* Example 7 and 24 were *outside* the claimed range (not less than 3.0) of the present invention.

11. The above results show that the printing plate precursor of Ichikawa does *not* inherently have the claimed A/B ratio of "not less than 3.0" the present invention.

I further declare that all statements made herein of my own knowledge are true and that all statement made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Date: July 23, 2003

By: Kimikazu Nagase
Kimikazu NAGASE

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